

# Aqueous Cleaner and CleanRinse™ Recycling System



## New Recycling System Improves Aqueous Cleaning System

Most traditional systems for pollution control focus on the end-of-pipe treatment and disposal of waste. The U.S. Environmental Protection Agency (EPA) has mandated a new emphasis on improved resource usage that focuses on source reduction. Many methods, including filtration, reverse osmosis, de-ionization, and distillation, could help meet this goal but often have high energy needs or produce additional waste streams.

With assistance from DOE's Inventions and Innovation Program, EcoShield Environmental Systems developed a simple mini-reactor system that chemically converts organic oily contaminants into surfactants and emulsifiers. This conversion increases the cleaning solution's ability to remove oil, grease, and dirt. The system regenerates the cleaning solution on site, creating less waste water and often decreasing the cleaning time required. The system has low energy needs and can be coupled with an energy-efficient bioreactor that will convert excess soap into biomass. The current applications of the technology have resulted in tremendous waste prevention and large cost savings.

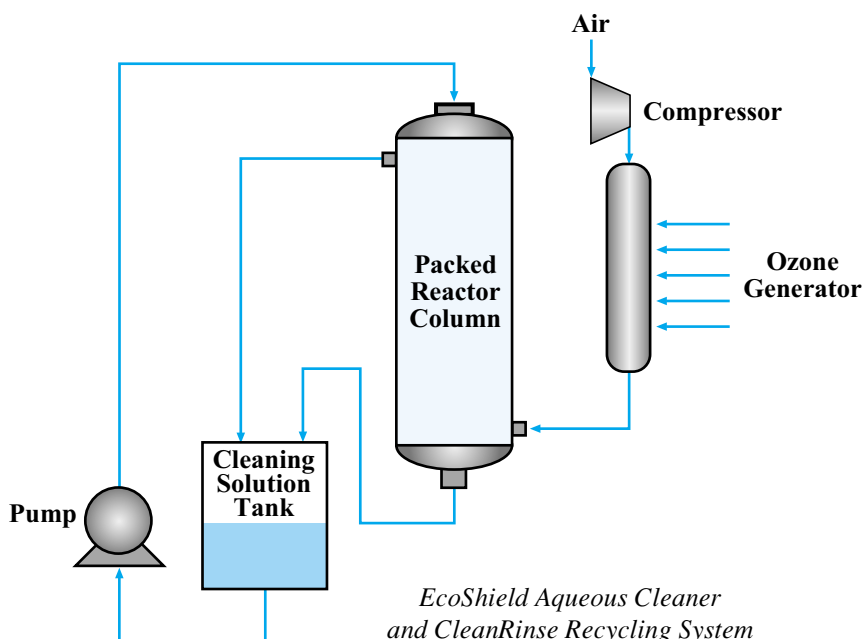
## Benefits

### Productivity

The system extends the life of the cleaning solution and rinse water, which reduces the costs associated with waste water disposal and chemical consumption. The system also has low operational costs (less than 5 cents per hour).

### Waste Reduction

The technology reduces the chemicals typically consumed in the traditional cleaning process and extends the life of the cleaning solution. The system can be integrated with EPA's permanent pollution prevention plans.



## Overview

- ◆ Developed by EcoShield Environmental Systems under an exclusive license from EcoShield Environmental Technologies Corporation
- ◆ Commercialized in 1997

## Energy Savings (Trillion Btu)

Cumulative through 2003	2003
0.104	0.015

## Emissions Reductions (Thousand Tons, 2003)

Particulates	SO <sub>x</sub>	NO <sub>x</sub>	Carbon
0.0	0.0	0.002	0.235

## Applications

Neutral to basic pH applications where aqueous waste streams containing organic contaminants are to be cleaned

## Capabilities

- ◆ Converts excess soap to biomass using an optional companion bioreactor.
- ◆ Offers custom sizes and configurations for wash racks, cabinet washers, and automated lines.
- ◆ Is applicable for high-temperature installations.